BYJU'S EXAM PREP

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Preparation App For All Exams

Lines & Angles and Polygons Part 2

BYJU'S EXAM PREP

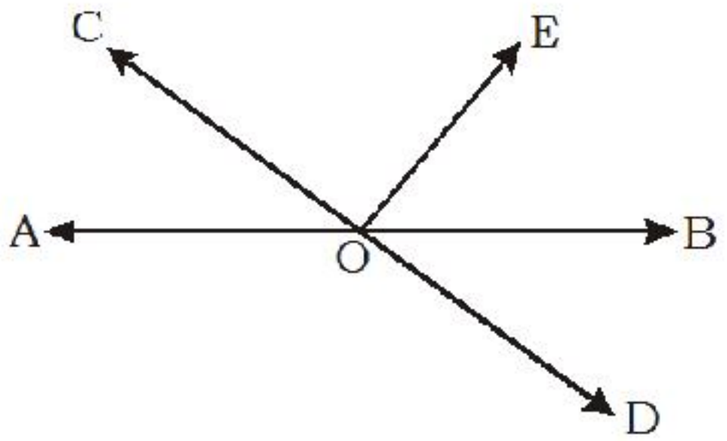
Agenda

* Practice Question on Lines & Angles & Polygons

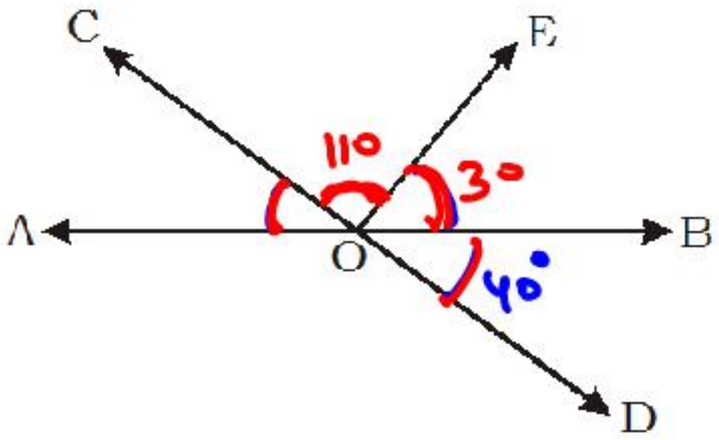
19 Question

** Homework → 27 Question

Q1. In the given figure lines AB and CD intersect at O. If $\angle AOC + \angle BOE = 70^\circ$ and $\angle BOD = 40^\circ$ then find $\angle BOE$ and reflexive $\angle COE$



(a) $30^\circ, 250^\circ$ (a) $70^\circ, 250^\circ$ (c) $30^\circ, 210^\circ$ (d) $70^\circ, 210^\circ$



$\angle AOC + \angle BOE = 70°$??

Adj $\angle COE$ = ??

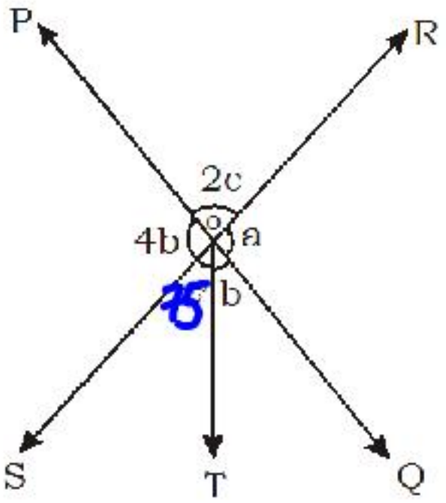
$360 - 110$

250

$\angle BOE = 30°$

Ans. (a)

Q2. In the given fig. two straight lines PQ and RS intersect each other at O. If ∠SOT = **75**°, find the value of a, b and c.



(a) a = 84°, b = 21°, c = 48°
(b) a = 48°, b = 20°, c = 50°
(c) a = 72°, b = 24°, c = 54°
(d) a = 64°, b = 28°, c = 45°

$4b + 75 + b = 180$

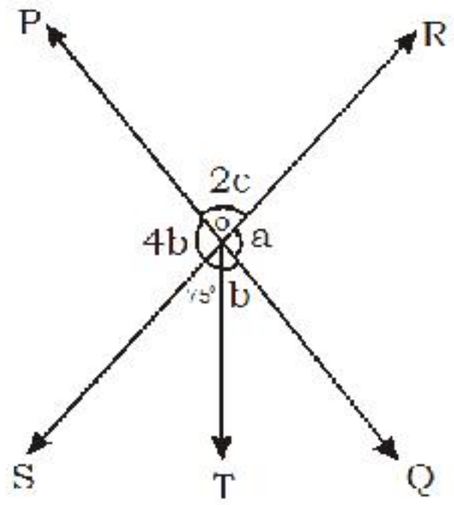
$b = 21^\circ$

$75 + 21 = 2c$

$c = 48$

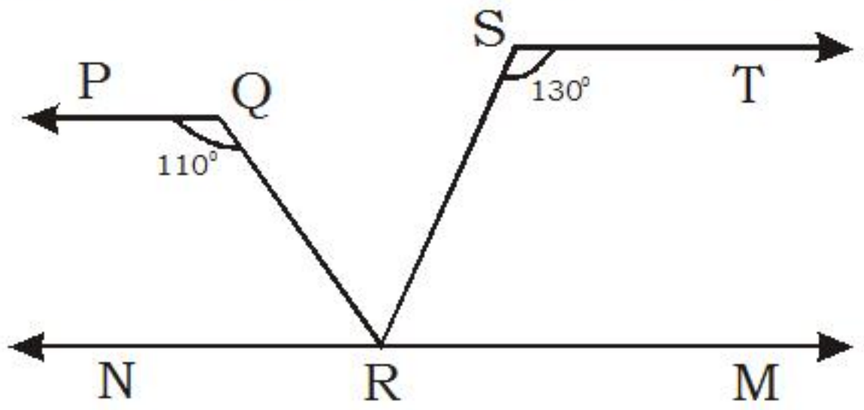
$a = 45$

$a = 84$

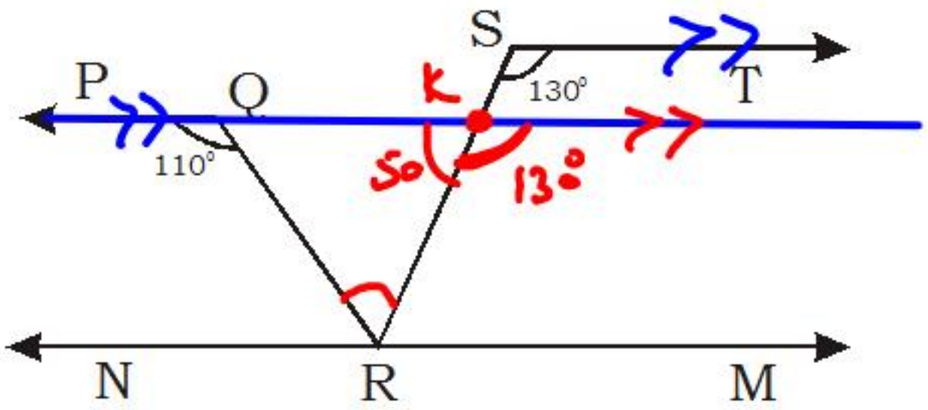

P
R
2c
4b
a
b
S
T
Q

Ans. (a)

Q3. In the given figure if PQ||ST, $\angle PQR = 110^0$ and $\angle RST = 130^0$, find $\angle QRS$



(a) 50^0 (b) 60^0 (c) 70^0 (d) 80^0



I st

$\angle QKR = 50^\circ$

$110 = 50 + \angle QRK$

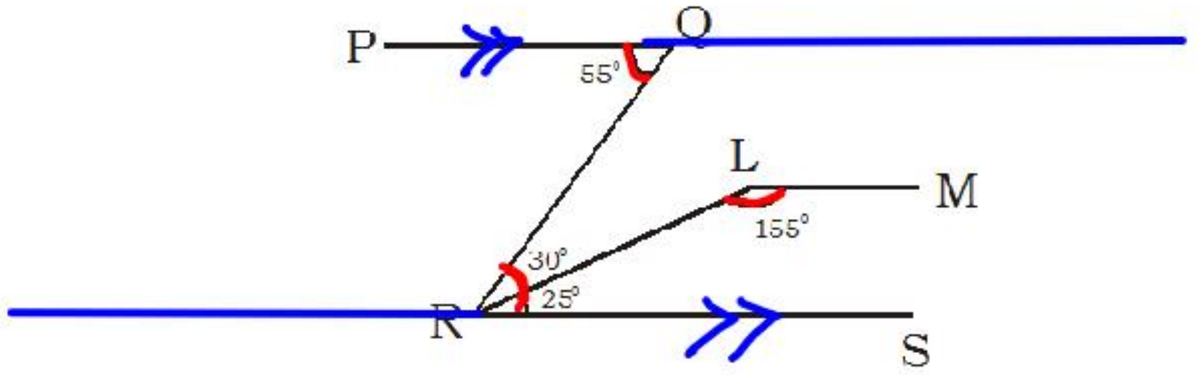
$\angle QRK = 60^\circ$

Ans. (b)

ANGLE BETWEEN 2 PARALLEL LINES

Angle b/w Parallel lines $\longrightarrow$ 180°

Q4. In the fig. given below RS is parallel to PQ what is the angle between lines PQ and LM?



(a) 175° (b) 177° (c) 179° (d) 180°

RS ∥ PQ

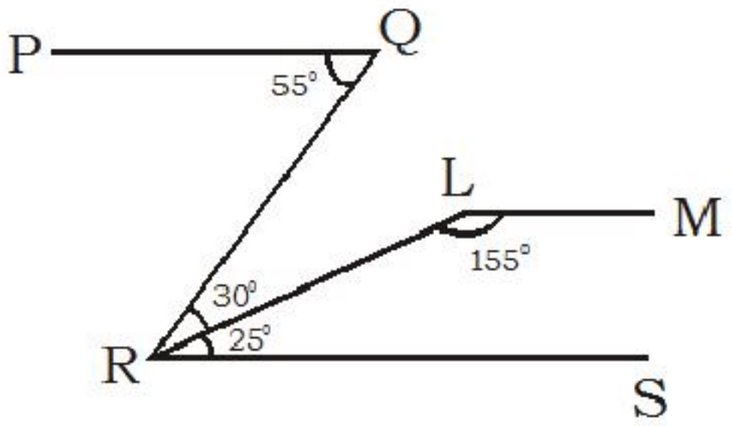
∠MLR = 155°

∠LRS = 25°

∠MLR + ∠LRS = 180°

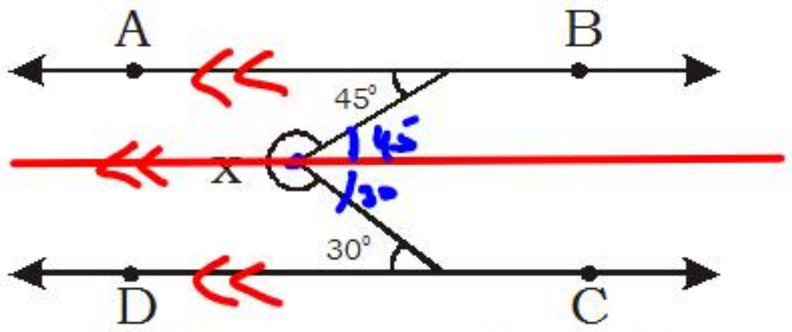
LM ∥ RS

LM ∥ PQ


P
Q
55°
L
M
155°
30°
25°
R
S

Ans. (d)

Q5. In the given fig. AB || CD, then x is equal to



(a) 290° (b) 300° (c) 280° (d) 285°

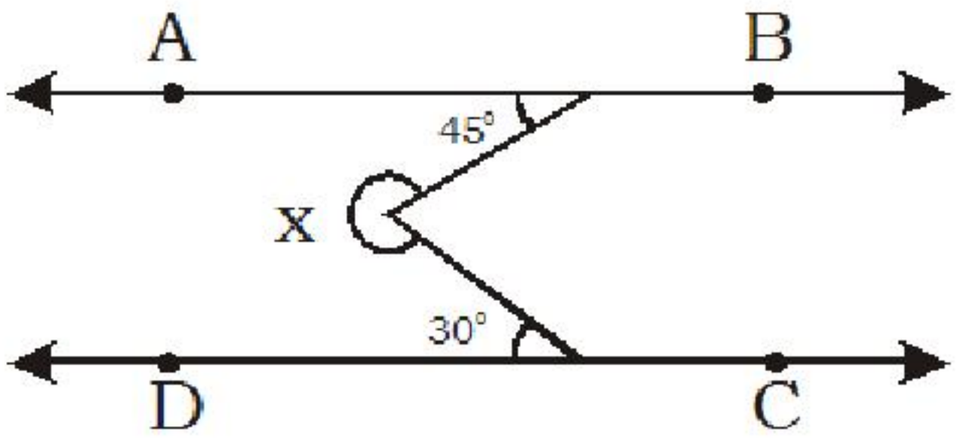
Shortcut

$45 + 30 + x = 360$

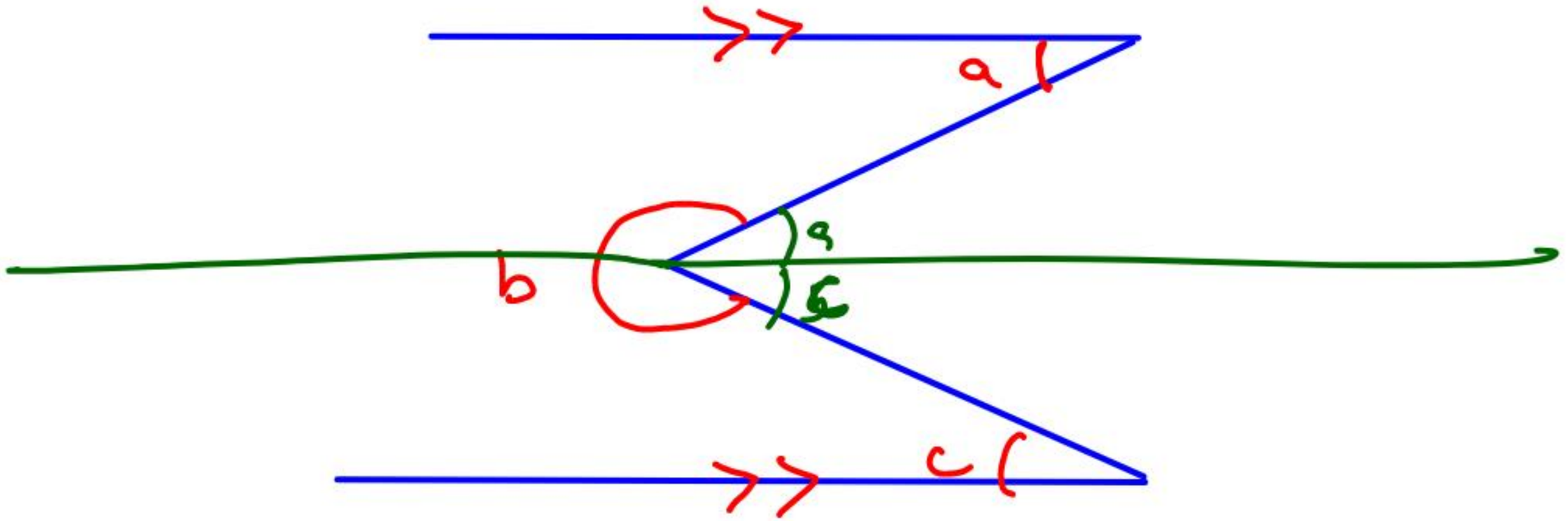
$x = 285$

$x = 360 - 75$

$= 285^\circ$

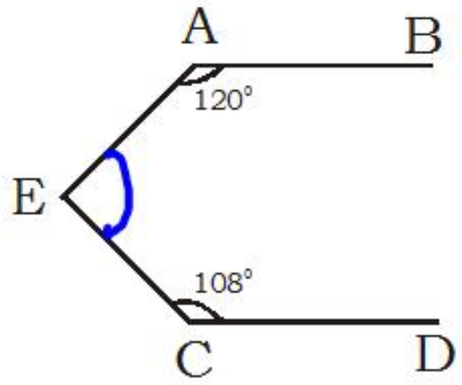

A
B
45°
x
30°
D
C

Ans. (d)



$$a + b + c = 360^\circ$$

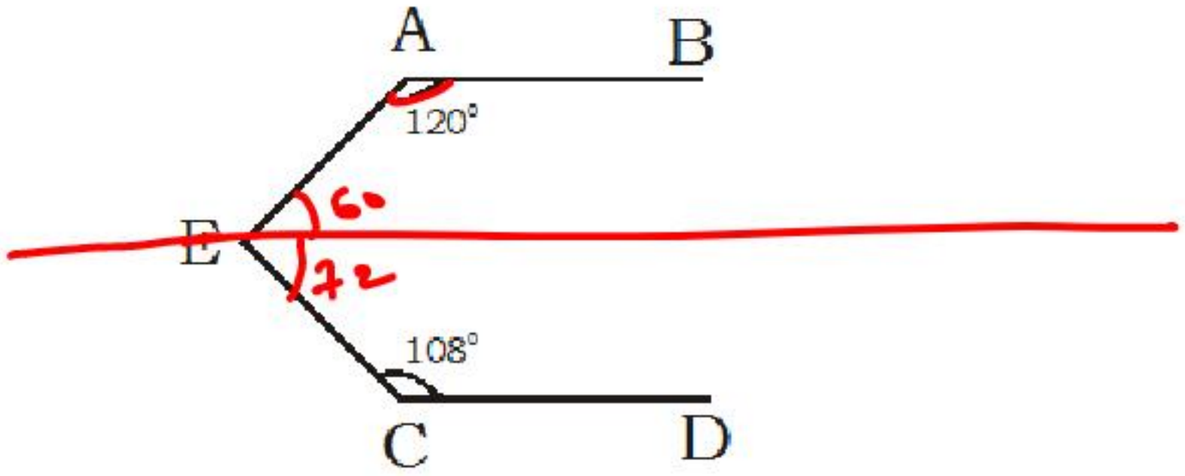
Q6. In the fig. AB ||CD, find ∠AEC



(a) 220° (b)140° (c)150° (d) 132°

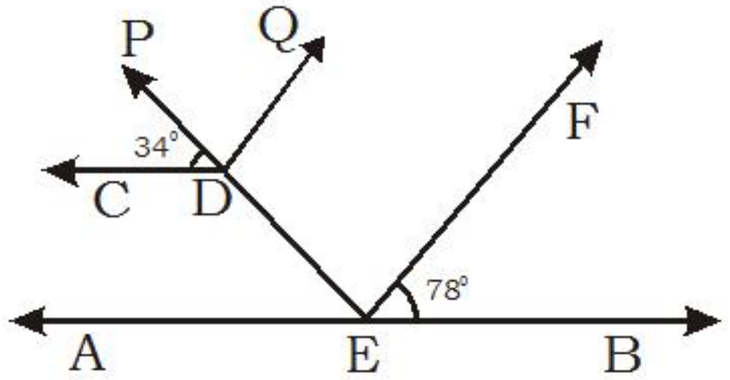
$120 + 108 + \angle AEC = 360^\circ$

$\angle AEC = 132$

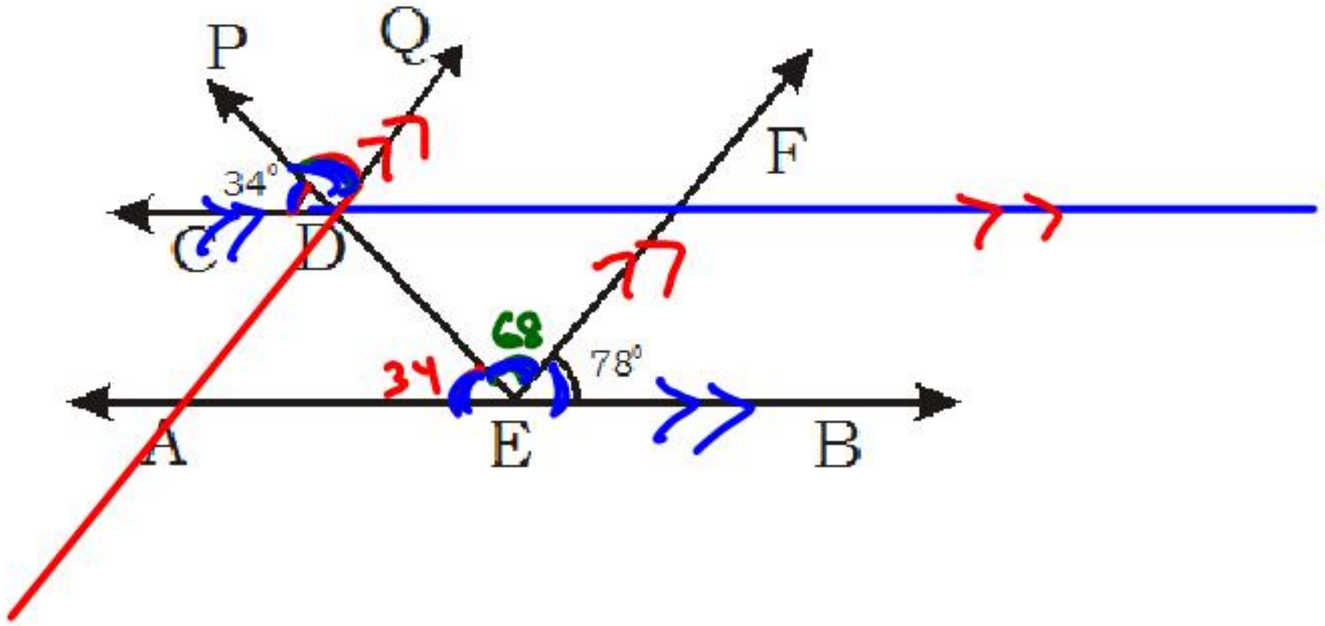

A
B
120°
E
60
72
108°
C
D

Ans. (d)

Q7. In the figure AB ||CD and EF||DQ, find the value of ∠PDQ



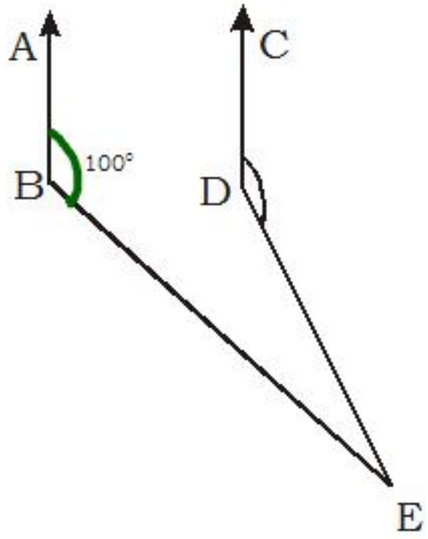
(a) 68^0 (b) 78^0 (c) 56^0 (d) None of these



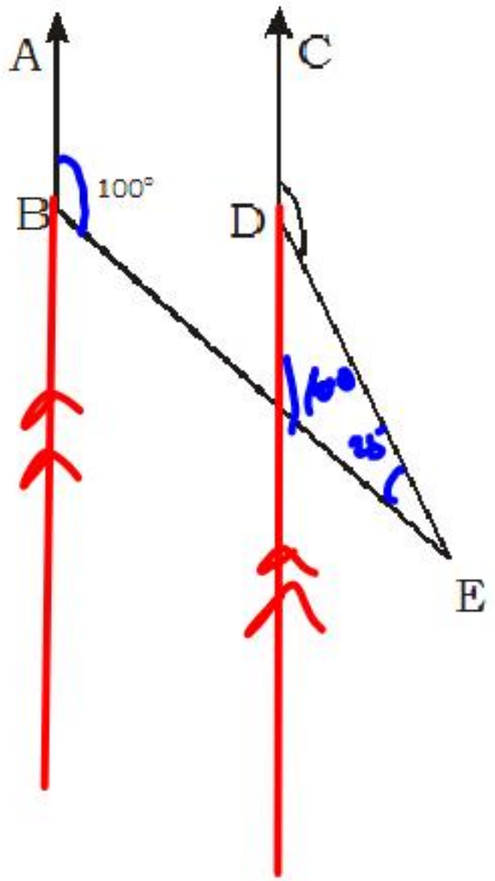
$\angle PDQ = 68$

Ans. (a)

Q8. In the given figure AB||CD, $\angle ABE = 100^0$ $\angle BED = 25^0$. Find $\angle CDE$



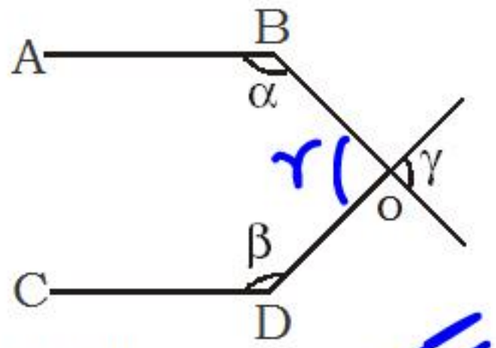
(a) 125^0 (b) 55^0 (c) 65^0 (d) 75^0



$\angle CDE = 125^\circ$

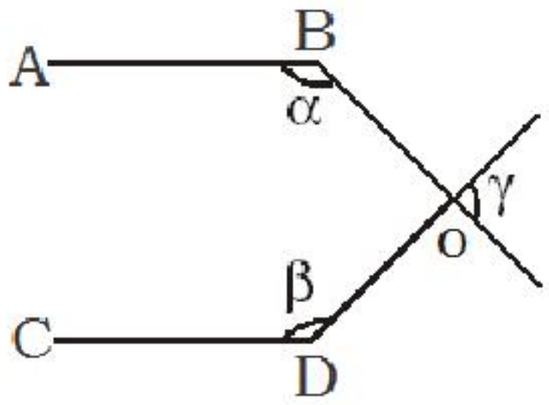
Ans. (a)

Q9. If AB||CD then find the value of $\alpha+\beta+\gamma$.



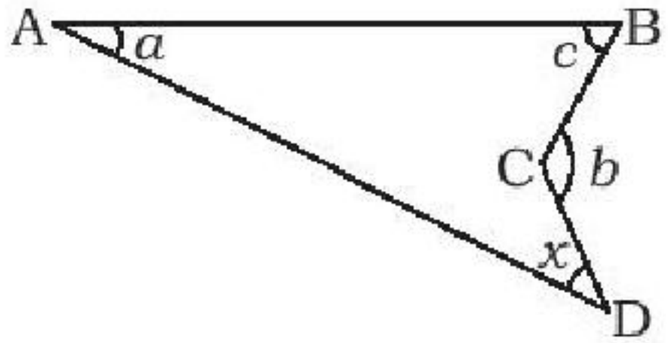
(a) 180^0 (b) 270^0 (c) 360^0 (d) 90^0

$\alpha+\beta+\gamma = 360^\circ$


A
B
α
γ
O
β
C
D

Ans. (c)

Q10.



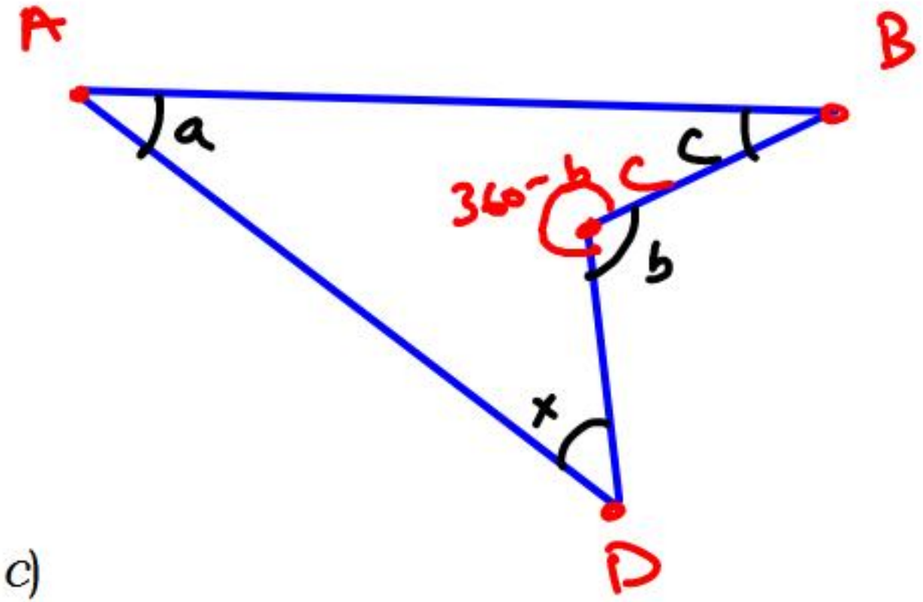
Find the value of x in above figure.

(a) $b - a - c$

(b) $b - a + c$

(c) $b + a - c$

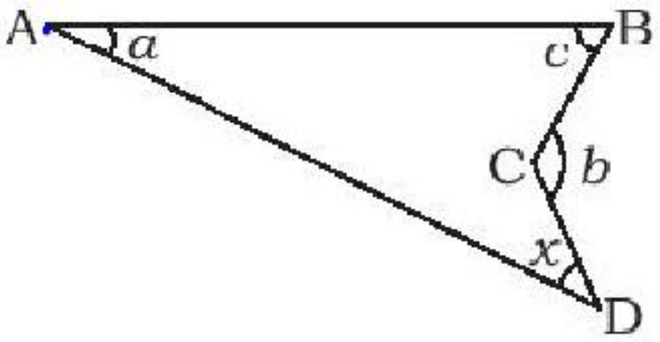
(d) $\pi - (a + b + c)$

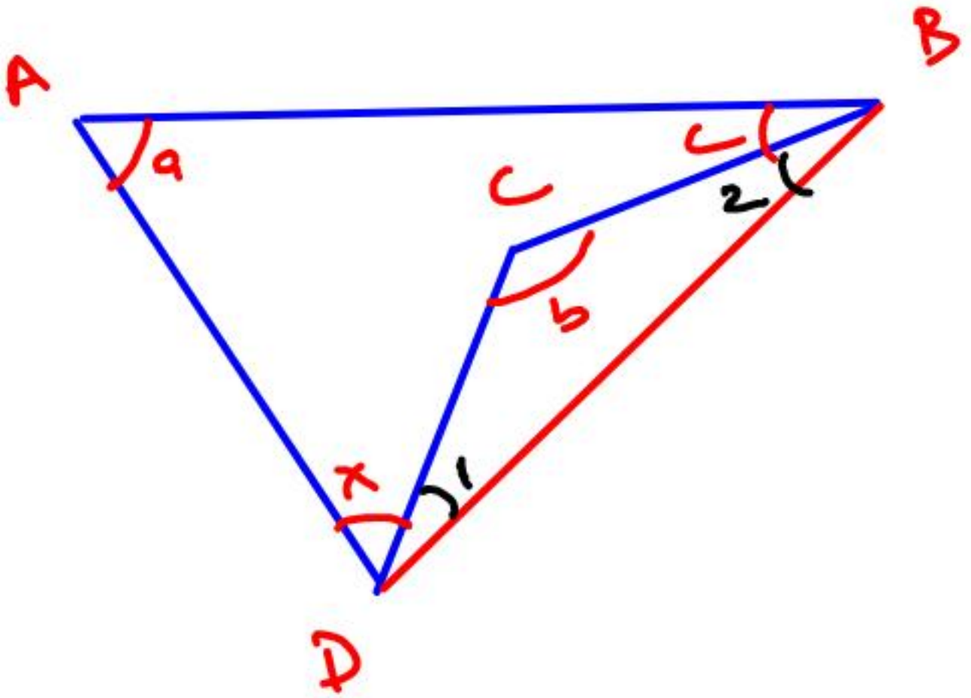


$a + c + 360 - b + x = 360$

$x = b - a - c$

Ind





$\triangle ABD$

$a + x + \angle 1 + c + \angle 2 = 180^\circ$

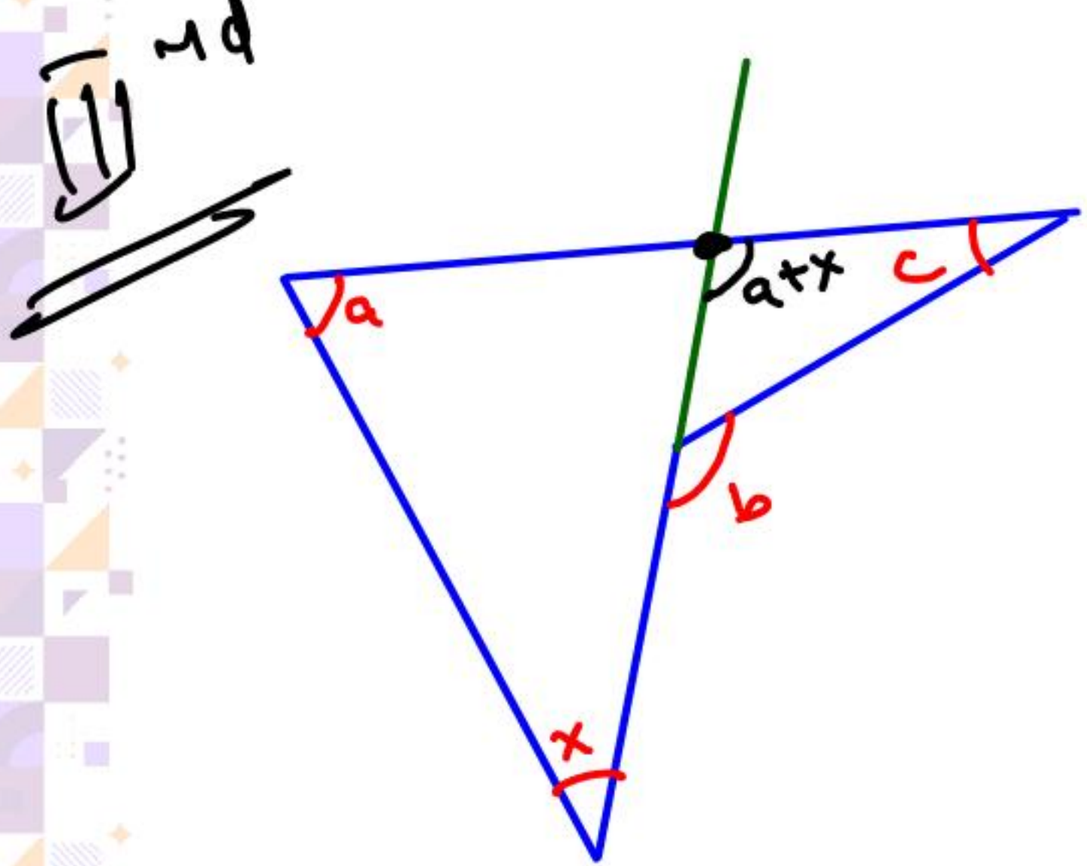
$\triangle CBD$

$b + \angle 1 + \angle 2 = 180^\circ$

$a + x + \cancel{\angle 1} + c + \cancel{\angle 2}$

$= b + \cancel{\angle 1} + \cancel{\angle 2}$

$x = b - a - c$



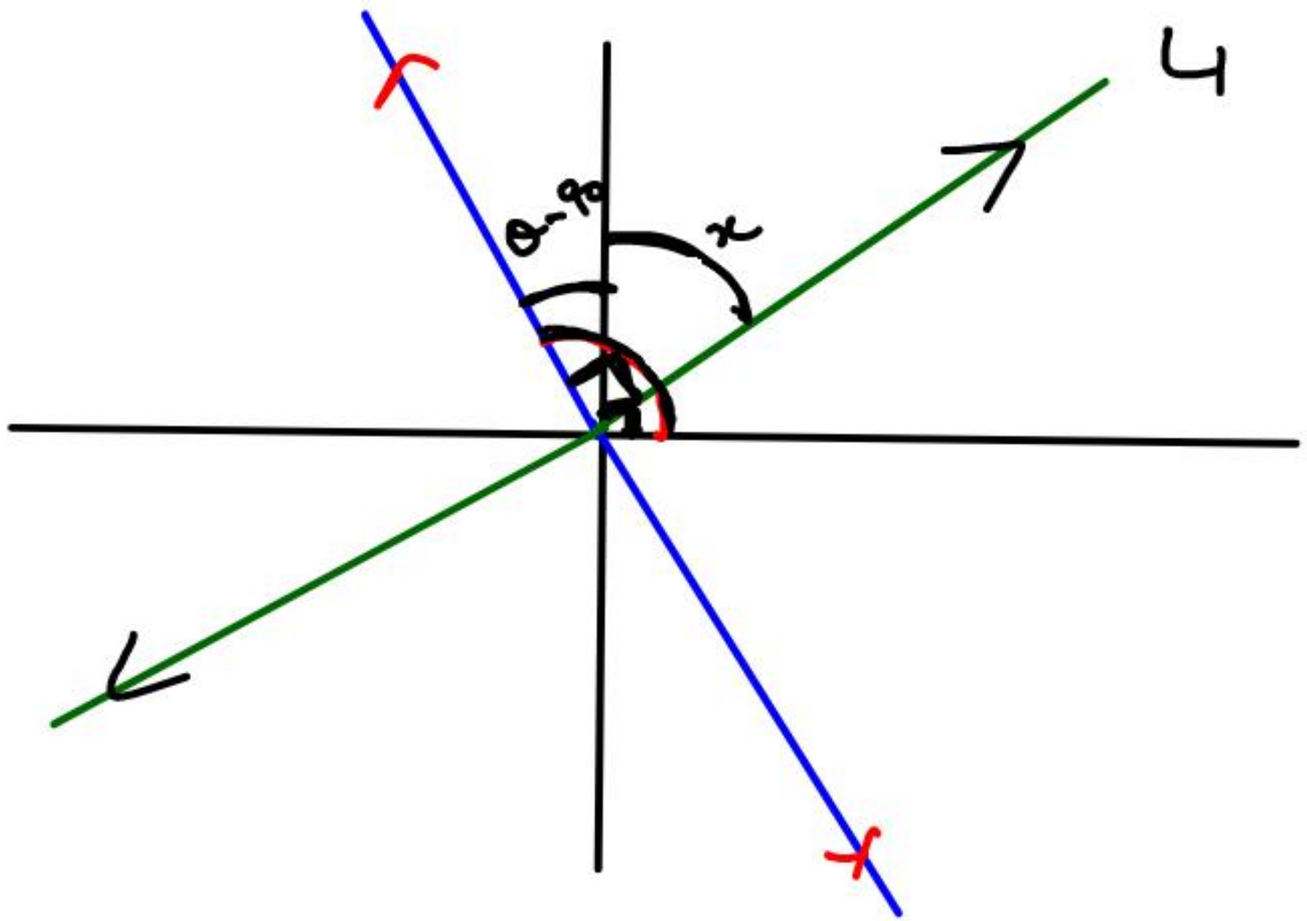
$$b = (a+x)+c$$

$$x = \underline{\underline{b-a-c}}$$

Ans. (a)

Q11. If a straight line L makes an angle θ ($\theta > 90^0$) with the positive direction of x - axis then the acute angle made by a straight line L_1 Perpendicular to L, with the y axis is

(a) $\frac{\pi}{2} + \theta$ (b) $\frac{\pi}{2} - \theta$ (c) $\pi + \theta$ (d) $\pi - \theta$



$\theta - 90 + x = 90$

$x = 180 - \theta$

$x = \pi - \theta$

Ans. (d)

Q12. In Regular Polygon, the exterior and interior angles are in the ratio 1:4. The number of sides of the polygon is :

(a) 10 (b) 12
(c) 15 (d) 16

Exterior : Interior → 1 : 4

5 → 180°

1 → 36°

$\frac{360}{n} = 36$

$n = 10$

Ans. (a)

Q13. The difference between the interior angle and the exterior angle at a vertex of a regular polygon is 150°. The number of sides of the polygon is :

(a) 10 (b) 15 (c) 24 (d) 30

$I - E = 150^\circ$ — (1)

$I + E = 180^\circ$ — (2)

(2) − (1)

$2E = 30^\circ$

$E = 15^\circ$

$\frac{360}{n} = 15$

$n = 24$

Ans. (c)

Q14. Each interior angle of a regular polygon is 144°. The number of sides of the polygon is :

(a) 8 (b) 9 (c) 10 (d) 11

$E = 36^\circ$

$\frac{360}{n} = 36$

$n = 10$

Ans. (c)

Q15. The number of sides in two regular polygons are in the ratio 5 : 4 and the difference between each interior angle of the polygon is 6°. Then the number of sides are :

(a) 15, 12 (b) 5, 4 (c) 10, 8 (d) 20, 16

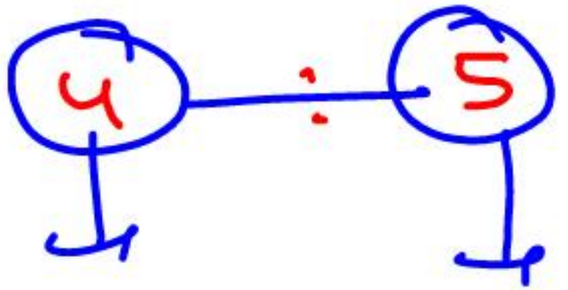
V. Imp

I St

No. of sides

Exterior

A	B
5	4



24° 30°

15 12

IInd

No. of sides $5x$, $4x$

Diff b/w Interior $\longrightarrow 6^\circ$

Sum of all interior angles $\longrightarrow (5x-2)180$

Each interior angle $\longrightarrow \dfrac{(5x-2)180}{5x}$

$$\frac{(5x-2)180}{5x} - \frac{(4x-2)180}{4x} = 6$$

$$\frac{30}{x}\left[\frac{5x-2}{5} - \frac{(4x-2)}{4}\right] = 6$$

$$\frac{30}{x}\left[\frac{20x-8-20x+10}{20}\right] = \frac{60}{20x} = 1$$

$x = 3$

Exterior angle of a Regular Polygon $\longrightarrow \frac{360}{n}$

Exterior Angle $\propto \frac{1}{n}$

Ans. (a)

Eg. Number of sides of 2 polygons are in the ratio 5 : 2 and difference between the interior angles is 27°. Find the number of sides in the 2 polygons.

	A		B
No. of sides	5	:	2
Exterior	2	:	5
	↓		↓
	18°		45°

20 | 8

Q16. Which of the following cannot be measure of an interior angle of a regular polygon

(a) 150^0 (b) 105^0

(c) 108^0 (d) 144^0

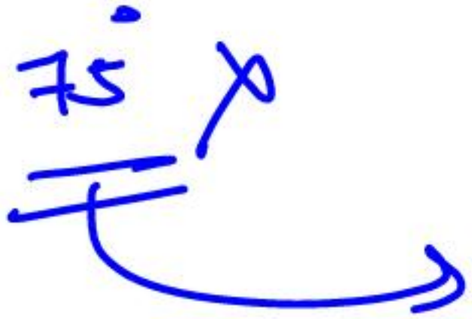
I

E

a) 150

$\frac{360}{n}$

b) 105



not a factor of 36.

Ans. (b)

Q17. The ratio of sides of two regular polygon is 1:2 and ratio of their internal angles is 2:3, what is the number of sides of polygon having more sides.

(a) 4 (b) 8

(c) 6 (d) 12

A B

No. of sides 1 : 2

4 → 180°

1 → 45°

Internal Angle 2 : 3

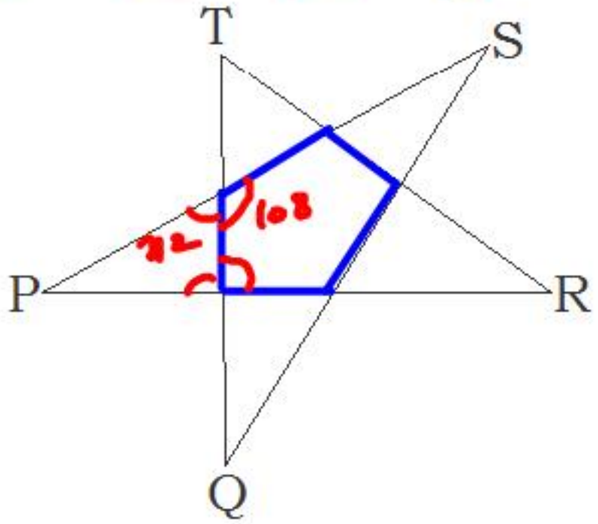
Exterior 2 : 1

90°

45° 8

Ans. (b)

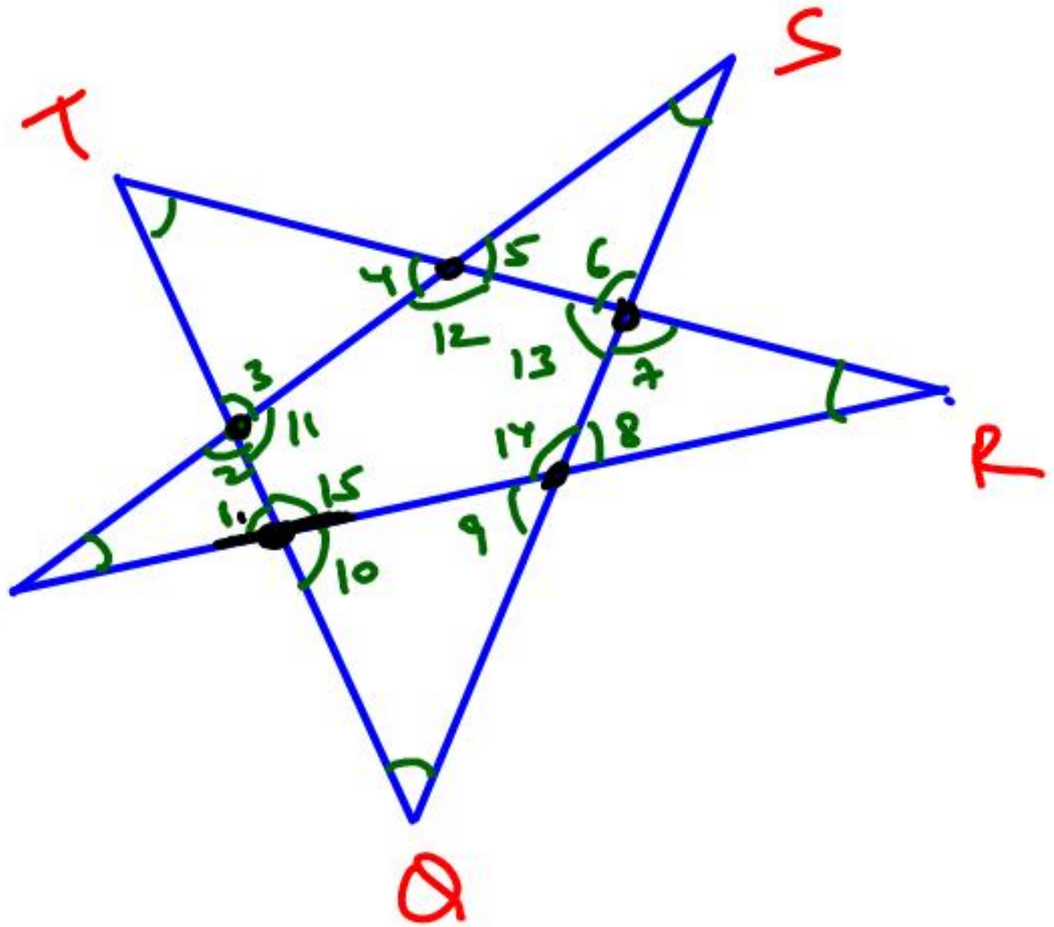
Q18. Find the value of $\angle P + \angle Q + \angle R + \angle S + \angle T$ in the given figure :



(a) 180 (b) 270 (c) 300 (d) 360

$\angle P = 36^\circ$

$36 \times 5 = 180^\circ$



$\angle 1+\angle 2+\angle P = 180^\circ$

$\angle 3+\angle 4+\angle 7 = 180^\circ$

$\angle 5+\angle 6+\angle 5 = 180^\circ$

$\angle 7+\angle 8+\angle R = 180$

$\angle 9+\angle 10+\angle Q = 180$

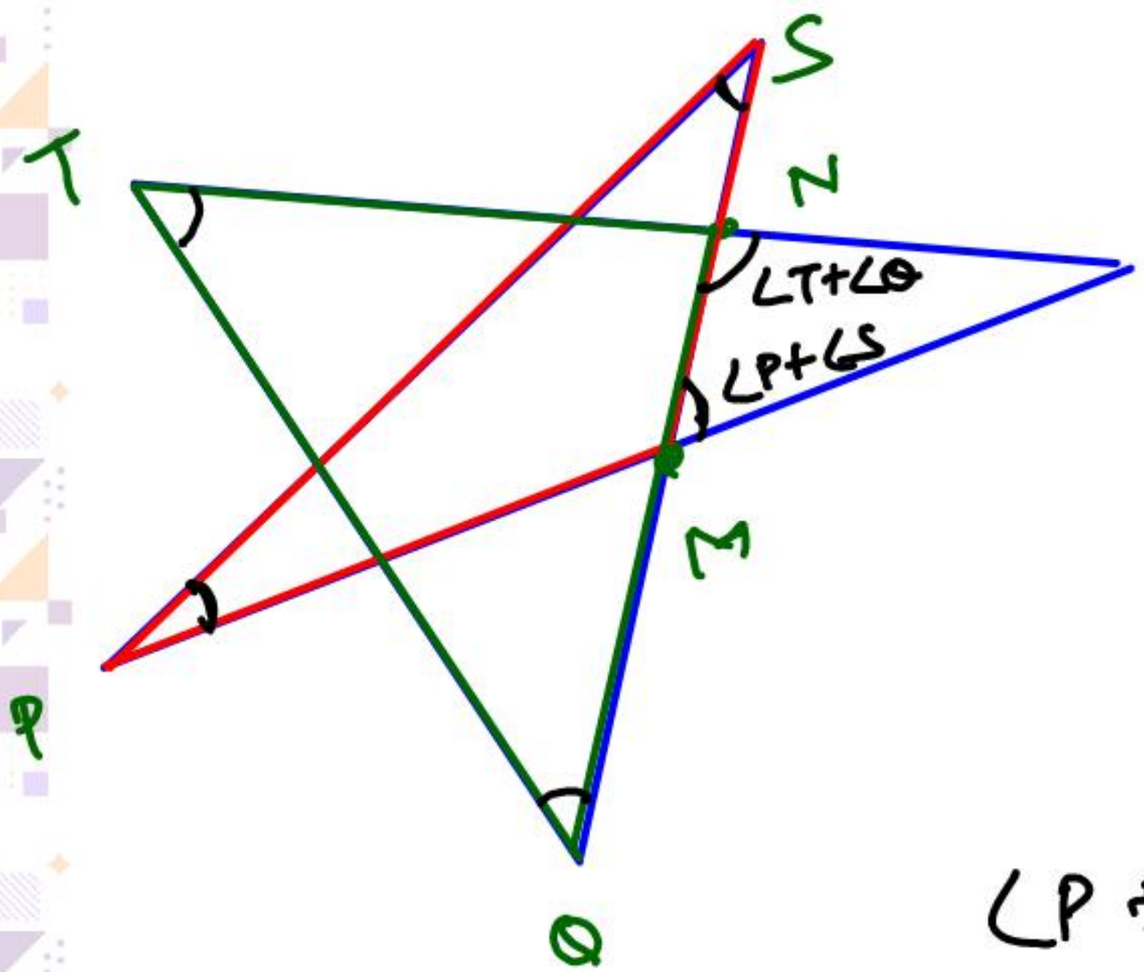
$(\angle 1-\angle 10)+2(\angle 11-\angle 15)=1800$ — (3)

$\angle 11-\angle 15 = 540$ — (2)

$\therefore \angle 1-\angle 10 = 720$

$(\angle 1-\angle 10)+(\angle P+\angle Q+\angle R+\angle S+\angle T)=900$ — (1)

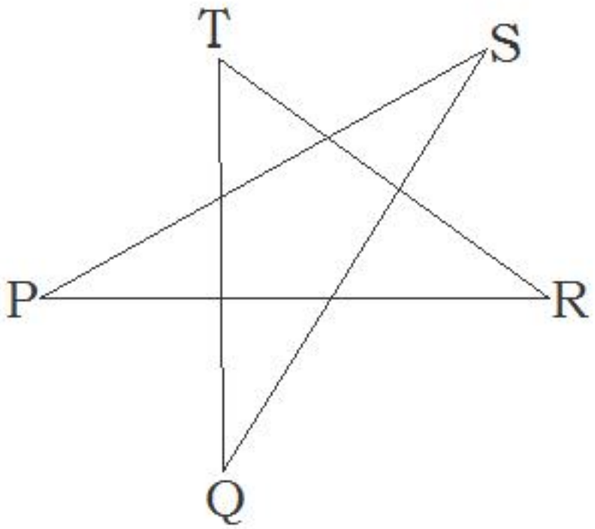
$\angle P+\angle Q+\angle R+\angle S+\angle T = 180^\circ$



ΔMRN

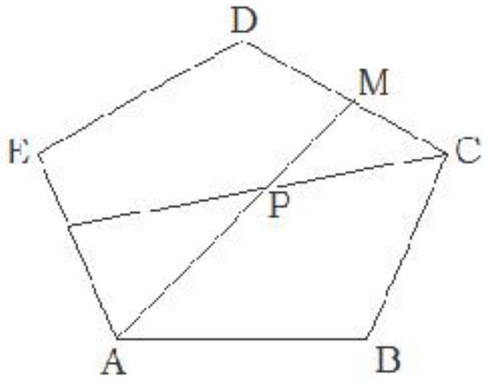
$\angle M + \angle N + \angle R = 180$

$\angle P + \angle S + \angle T + \angle Q + \angle R = 180^\circ$

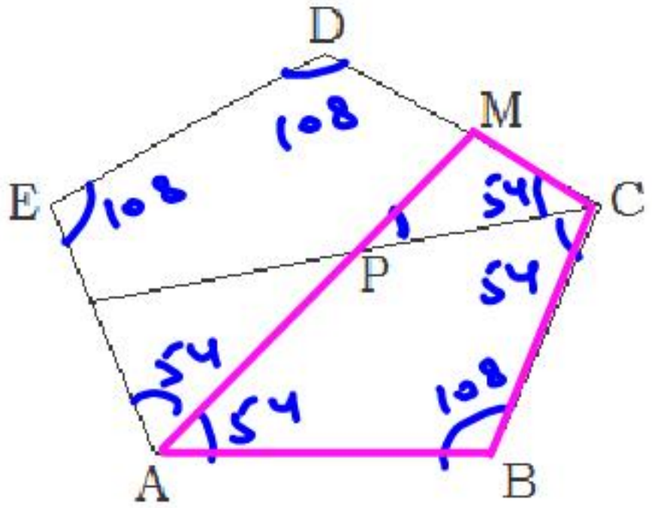

T
S
P
R
Q

Ans. (a)

Q19. In Regular Pentagon ABCDE, angle bi-sector of A meets at side CD on point M and angle bi-sector of C meets side AM at point P, then find the value of ∠CPM.



(a) 18 (b) 36 (c) 54 (d) 72



$54 + 108 + 108 + \angle M = 360$

$\angle M = 90^\circ$

$\triangle CMP$

$54 + 90 + \angle CPM = 180^\circ$

$\angle CPM = 36^\circ$

Ans. (b)

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HOMEWORK

Q1. Let OA, OB, OC and OD are rays in the anticlockwise direction such that $\angle AOB = \angle COD = 100^\circ$, $\angle BOC = 82^\circ$ and $\angle AOD = 78^\circ$.

Consider the following statements:

1) AOC and BOD are lines.

2) $\angle BOC$ and $\angle AOD$ are supplementary.

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Ans. D

Q2. . The length of a line segment AB is 2 units. It is divided into two parts at the point C such that $AC^2 = AB \times CB$. What is the length of CB?

A. $3 + \sqrt{5}$ units

B. $3 - \sqrt{5}$ units

C. $2 - \sqrt{5}$ units

D. $\sqrt{3}$ units

Ans. B

Q3. AB is a straight line, C is point whose distance from AB is 3 cm. What is the number of points which are at a distance of 1 cm from AB and 5 cm from C?

A. 1 B. 2 C. 3 D. 4

Ans. D

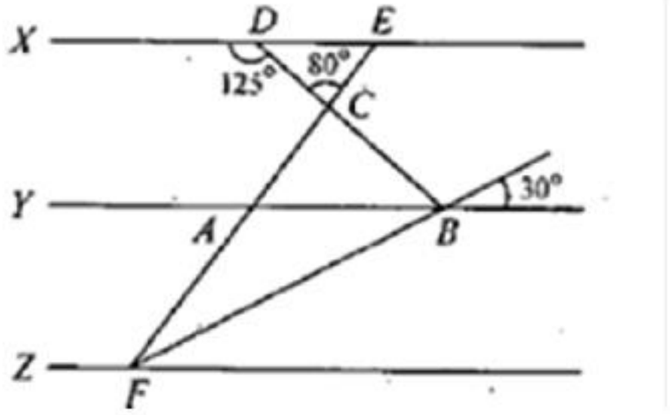
Q4. Two traversals S and T cut a set of distinct parallel lines. S cuts the parallel lines in points A, B, C and D and T cuts the parallel lines in points E, F, G, H respectively. If AB =4, CD = 3 and EF = 12, then what is length of GH?

A. 4 B. 6 C. 8 D. 9

Ans. D

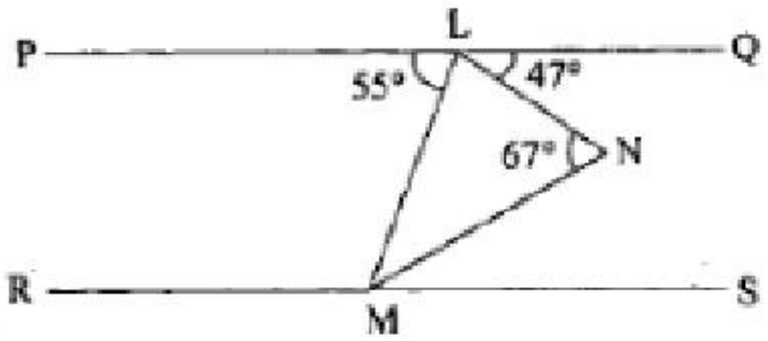
Q5. Three straight lines X, Y and Z are parallel and the angles are as shown in the figure above. What is ∠AFB equal to?

A. 20^0
B. 15^0
C. 30^0
D. 10^0



Ans. B

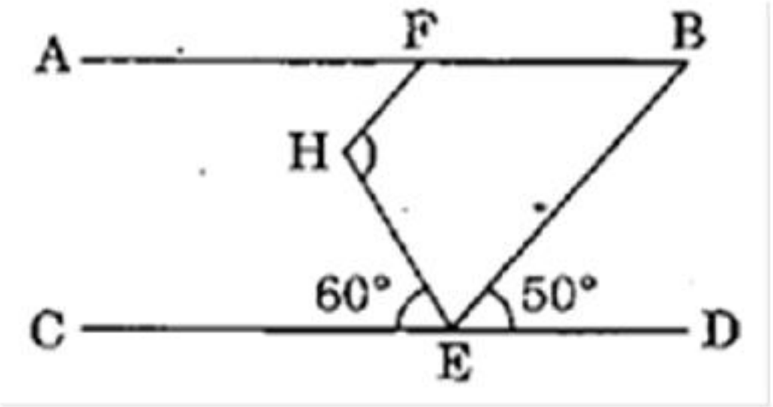
Q6. In the figure given above PQ is parallel to RS. What is ∠NMS equal to?



A. 20^0 B. 23^0 C. 27^0 D. 47^0

Ans. A

Q7. In the figure AB is parallel to CD and BE is Parallel to FH. What is ∠ FHE equal to?



A. 110° B. 120° C. 125° D. 130°

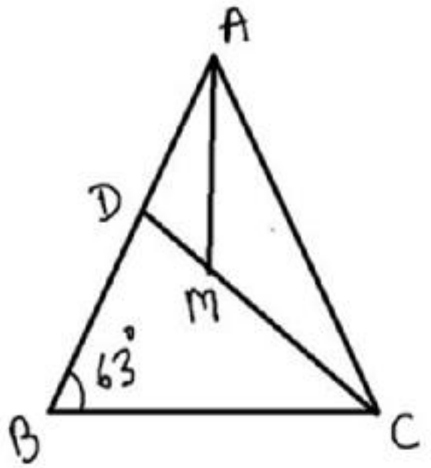
Ans. A

Q8. If a transversal intersects four parallel straight lines, then the number of distinct values of the angles formed will be

A. 2 B. 4 C. 8 D. 16

Ans. A

Q9. In the given figure , AM=AD , $\angle B = 63^0$ and CD is an angle bisector of $\angle C$, then $\angle MAC = ?$



A. 63^0

B. 27^0

C. 37^0

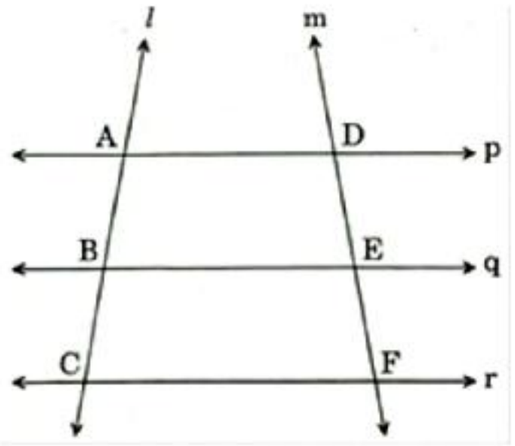
D. none of these

Ans. A

Q10. In the figure given below, p, q, r are parallel lines; l and m are two transversals.

1) AB : AC = DE : DF 2) AB × EF = BC × DE

Which of the above is/ are correct?



A. 1 only B. 2 only

C. Both 1 and 2 D. Neither 1 nor 2

Ans. C

Q11. Given that the angles of a polygon are all equal and each angle is a right angle.
Statement-1 : The polygon has exactly four sides.
Statement-2: The sum of the angles of a polygon having n sides is (3n - 8) right angles.

Which one of the following is correct in respect of the above statements?

A. Both Statement-1 and Statement-2 are true and Statement-2 is the correct explanation of Statement-1.
B. Both Statement-1 and Statement-2 are true but Statement-2 is not the correct explanation of Statement-1.
C. Statement-1 is true but Statement-2 is false.
D. Statement-1 is false but Statement-2 is true.

Ans. C

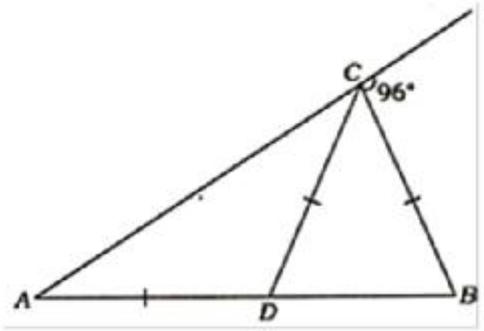
Q12. There are 8 lines in a plane, no two of which are parallel. What is the maximum number of points at which they can intersect?

A. 15
B. 21
C. 28
D. None of the above

Ans. C

Q13. In the figure given above, $AD = CD = BC$.

What is the value of $\angle CDB$?



A. 32°

B. 64°

C. 78°

D. Cannot be determined due to insufficient data

Ans. B

Q14. . The line segments AB and CD intersect at O. OF is the internal bisector of obtuse angle BOC and OE is the internal bisector of acute angle AOC. If $\angle BOC = 130^0$, what is the measure of $\angle FOE$?

A. 90^0

B. 110^0

C. 115^0

D. 120^0

Ans. A

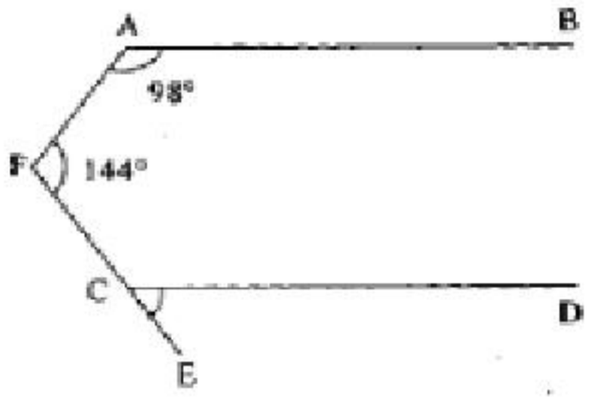
Q15. In the figure above, AB is parallel to CD. If $\angle BAF = 98^0$ and $\angle AFC = 144^0$, then what is $\angle ECD$ equal to?

A. 62^0

B. 64^0

C. 82^0

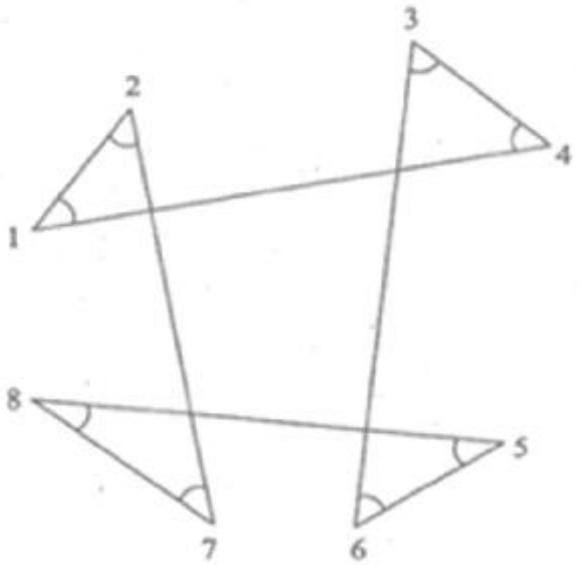
D. 84^0



Ans. A

Q16. Angles are shown in the given figure. What is value of $\angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5 + \angle 6 + \angle 7 + \angle 8$?

A. 240° B. 360° C. 540° D. 720°



Ans. B

Q17. If each interior angle of a regular polygon is 135°, then the number of diagonals of the polygon is equal to

A. 54 B. 48 C. 20 D. 18

Ans. C

Q18. If each side of a regular octagon is 5 cm then find its area?

A. $25(\sqrt{2}+1)$

B. $50(\sqrt{2}+1)$

C. $75(\sqrt{2}+1)$

D. None of these

Ans. B

Q19. The number of sides of two regular polygons are in the ratio 5 : 4. The difference between their interior angles is 9°. Consider the following statements :

1) One of them is a pentagon and the other is a rectangle.

2) One of them is a decagon and the other is an octagon.

3) The sum of their exterior angles is 720°.

Which of the above statements is/ are correct?

A. 1 only

B. 2 only

C. 1 and 3

D. 2 and 3

Ans. D

Q20. . Consider the following statements:

1) There exists a regular polygon whose exterior angle is 70°.

2) Let $n \geq 5$. Then the exterior angle of any regular polygon of n sides is acute.

Which of the above statements is/are correct?

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Ans. B

Q21. Find the measure of an angle which is 20^0 more than its complement.

(a) 55
(b) 35
(c) 45
(d) 25

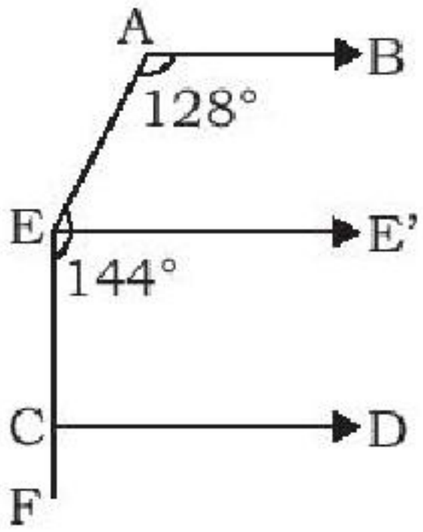
Ans. (a)

Q22. Sides AB and AC of a triangle ABC are equal side BC is produced to point D. From a point E on AC, line EF is drawn parallel to AB. Consider the quadrilateral ECDF thus formed. If $\angle ABC = 65^0$ and $\angle EFD = 80^0$, then what is the value of $\angle FDC$

(a) 43^0 (b) 41^0 (c) 37^0 (d) 35^0

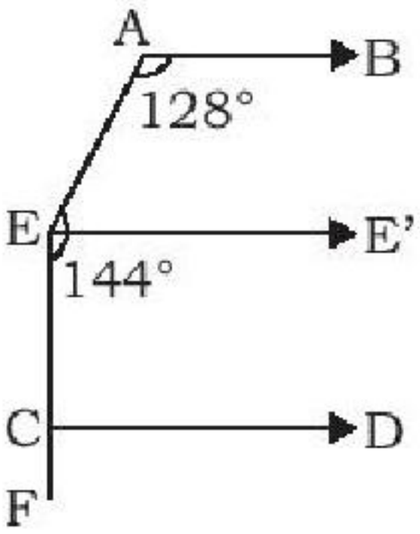
Ans. (d)

Q23. In the given figure AB || CD, ∠A = 128°, ∠AEC = 144° then ∠FCD = ?



(a) 72° (b) 64° (c) 136° (d) 92°

Ans. (d)



Q24. The sum of the interior angles of a polygon is 1440°. The number of sides of the polygon is :

(a) 6 (b) 9 (c) 10 (d) 12

Ans. (c)

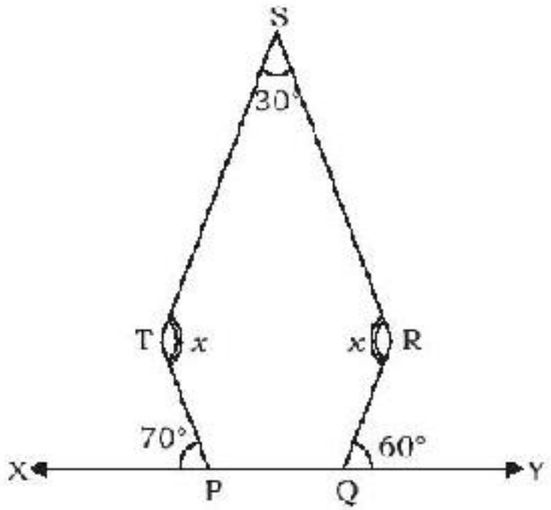
Q25. A polygon has 35 diagonals. The number of sides in the polygon is :

(a) 6 (b) 9 (c) 10 (d) 12

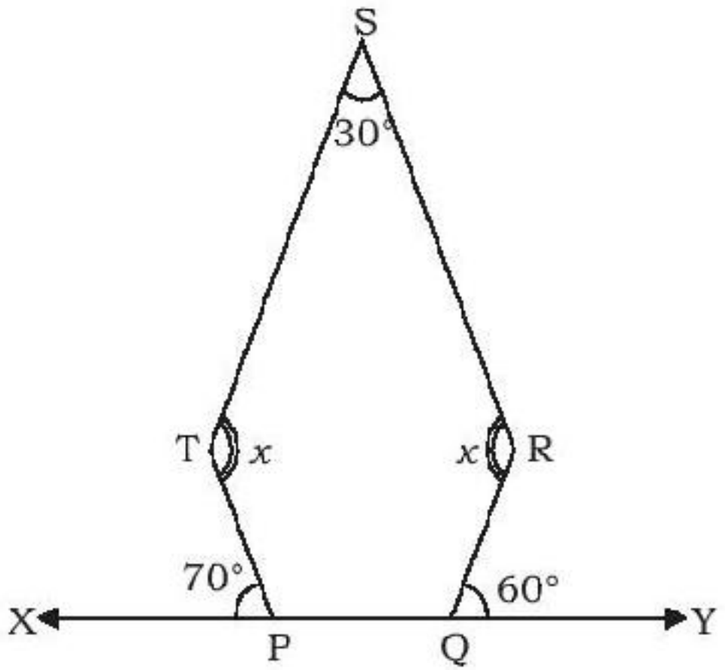
Ans. (c)

Q26. Find the value of x in following figure :

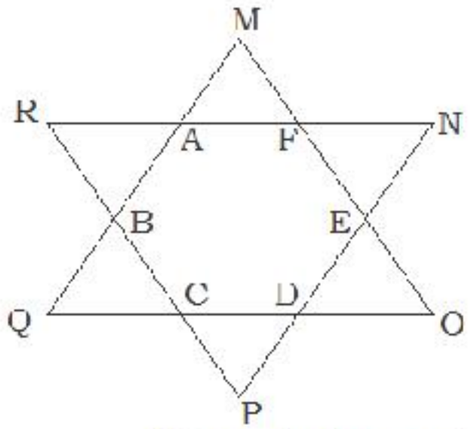
(a) 120 (b) 130 (c) 140 (d) 160



Ans. (c)



Q27. The sides of a hexagon are produced to meet so as to form a star shaped figure, as shown. The sum of the angles at the vertices of the star i.e $(\angle M + \angle N + \angle O + \angle P + \angle Q + \angle R)$



(a) 2 rightangle
(b) 8 rightangle
(c) 4 rightangle
(d) 6 rightangle

Ans. (c)